Management Services in Government

November 1978 Volume 33 Number 4

Management Services in Government

Incorporating the O & M Bulletin

November 1978 Volume 33 Number 4

Published by the Civil Service Department, Management Services, in collaboration with Departmental Management Services Officers. Correspondence and contributions should be addressed to The Editor, Management Services in Government, Civil Service Department, Whitehall, London SW1A 2AZ

ISSN: 0307-8558

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Why is Implementation So Difficult?

Professor L. A. GUNN

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Introduction

Academics have often seemed obsessed with policy formation while leaving the 'practical details' of policy implementation to administrators. The interests of theorists and practitioners appear, however, to have moved closer in the past few years. There is some concern among administrators about the tendency to blame them for the failure of policies which may be non-implementable for reasons beyond their control. A policy measure may be unrealistic or produce undesired side-effects, or legislators may will the end (a policy or programme) but be reluctant to will the means (adequate resources). This is not the place to discuss cases or even the validity of such arguments, but readers will be familiar with alleged problems of implementability in such policy areas as rents and housing, employment, control of pollution, taxation, urban renewal and land development.

Social scientists, too, have expressed concern about the implementability of some public policies, but there has been a more general interest among theorists in the activity of implementation itself. This article will incorporate some recent academic contributions to the study of implementation, in the hope that they will be of interest to administrators. The first major study of the implementation process, by J. L. Pressman and A. Wildavsky, came from the United States, and other American writers have been influential.[1] Most recently, however, some outstanding contributions have come from British universities, by writers such as Anthony King and Christopher Hood.[2]

It is from Hood that I have borrowed the approach of setting up a model of 'perfect administration' to help us identify what would be the preconditions of achieving completely effective implementation of public policies. This is as 'unreal' a concept as, say, 'perfect competition' in economic theory or 'rational decision-making' in policy analysis, but its very practical purpose is to help us think more systematically about the reasons for implementation failures and about approaches to improving the implementation process. For reasons that will become clearer as we go on, it should be said that we are here concerned with exploring the *idea* of perfect implementation and do not necessarily

offer it as an *ideal*, since some of the costs of attaining it might properly be regarded as unacceptable in a free society.

Preconditions necessary to achieve perfect implementation

What preconditions would have to be satisfied, then, if perfect implementation were to be achieved? At least ten can be suggested, as follows.

First, that circumstances external to the implementing agency do not impose crippling constraints

Some obstacles to effective implementation are outside the control of administrators because they are external to the policy and the implementing agency. Such obstacles may be physical, as when an agricultural programme is set back by drought or disease. Or they may be political, in that either a policy or the measures needed to achieve it are unacceptable to interests (such as party activists, trade unions or, in some societies, the military) which have the power to veto them. These constraints are obvious and there is little that administrators can do to overcome them except in their capacity as advisers, by ensuring that such possibilities are borne in mind during the policy-making stage.

Second, that adequate time and sufficient resources are made available to the programme

This condition partly overlaps the first, in that it often comes within the category of external constraints. But policies which are physically or politically feasible may still fail to achieve stated intentions. A common reason is that too much is expected too soon, especially when changes in attitudes or behaviour are involved (as, for example, in attempts to alter work methods and relationships). Or financial restrictions may starve a programme of adequate resources, as has been alleged of the 1974 Control of Pollution Act (since in the early years most local authorities lacked funds to appoint the necessary additional staff). A more unusual problem arises when special funds are available but have to be spent within an unrealistically short time, faster than the programme can effectively absorb them. Again, it is difficult to see what administrators can do in these situations, except through advice to their political masters.

Third, that not only are there no constraints in terms of overall resources but also that, at each stage in the implementation process, the required combination of resources is actually available

Acute bottlenecks can be created within a complex programme when essential combinations of resources are not available when needed. Particularly severe disruptions threaten when scarce resources are in the nature of a relatively fixed *stock* rather than a *flow*. The flow of additional funding for a programme can be swiftly increased, given political assent, by a turn in the fiscal 'tap'. But a shortage in, say, the stock of seasoned timber can hold up a local building programme for

months. Or a dearth of skilled carpenters may seriously constrain a housing rehabilitation programme. The main responsibility for such crises in implementation properly lies with programme designers and executives and we have, of course, seen major advances in relevant administrative techniques, such as manpower planning and network planning and control.

Fourth, that the policy to be implemented is based upon a valid theory of cause and effect

Policies are sometimes ineffective not because they are badly implemented, but because they are bad policies. That is, the policy may be based upon an inadequate understanding of a problem to be solved, its causes and cure; or of an opportunity, its nature and what is needed to exploit it. Pressman and Wildavsky describe any policy as a 'hypothesis containing initial conditions and predicted consequences'. That is, the typical reasoning of the policy-maker is along the lines of 'if X is done at time t(1) then Y will result at time t(2)'. Thus every policy incorporates a theory of cause and effect and, if the policy fails, it may be the underlying theory that is at fault rather than the execution of the policy.

Pressman and Wildavsky develop their argument from the detailed case-study of the failure of a programme in the late 1960s aimed at creating employment for members of minority groups in the Californian city of Oakland. The programme provided funds for public works and for making building and other loans available to private firms, in hopes that (*a*) resulting business opportunities would be taken up by investors and (*b*) result in the creation of new jobs which would (*c*) be filled by Negroes and Mexicans. Despite much initial goodwill the programme achieved very little. Few loans were taken up by firms and some proposals for public works came to nothing. Even when funds were spent as intended, the net increase in employment of members of minority groups was disappointingly small. One of Pressman and Wildavsky's conclusions was that the programme was based upon an inadequate theory of work-creation: the seeming failure of implementation was, at least in part, a failure of policy-making.

Fifth, that the relationship between cause and effect is direct and that there are few, if any, intervening links

Even from the very broad outline of the Oakland programme in the last paragraph, it will be seen that the theory underlying the policy was more complex than a simple 'if X, then Y' and extended the causal chain to 'if X, then Y, and if Y, then Z'. Pressman and Wildavsky argue that policies which depend upon a long sequence of cause and effect relationships have a particular tendency to break down, since 'the longer the chain of causality, the more numerous the reciprocal relationships among the links and the more complex implementation becomes'. In other words, the more links in the chain, the greater the risk that

some of them will prove to be poorly conceived or badly executed. In the case of the Oakland programme a cruder but also more direct approach to work-creation might have had greater success. Given the complexity of some recent British programmes, however, it would ill become us to be over-critical.

Sixth, that there is a single implementing agency which need not depend upon other agencies for success or, if other agencies must be involved, that the dependency relationships are minimal in number and importance

The Oakland programme involved a federal agency in Washington (the Economic Development Administration) and its field-officers in California, other federal agencies, the state government of California, the municipal government of Oakland, private firms, trade unions and many other groups and individuals. Where implementation requires not only a complex series of events and linkages but also agreement at each event among a large number of participants, then the probability of a successful or even a predictable outcome must be further reduced. Or as Pressman and Wildavsky suggest: 'Adding the number of necessary clearances involved in decision points throughout the history of the programme will give an idea of the task involved in securing implementation.' (Definitions: a *decision point* will be reached each time an act of agreement has to be registered for the programme to continue, and *clearance* is the name given to each instance in which a separate participant is required to give his consent.)

One of the larger projects in the Oakland programme involved no fewer than 30 major decision points and at least 70 clearance actions. In such a situation the probability of smooth implementation became virtually nil. Even if each participant had shown a propensity to agree and the probability of a given clearance actually occurring had been very high, the overall chances would still not have been good. Given 80 per cent probability of agreement at each clearance, the probability that no disagreement would take place over 30 decision points and 70 clearances was computed at little more than one in a million. To get close to a 50/50 chance of overall agreement would have required an unrealistically high probability (99 per cent) of agreement at any given clearance.

It is not only in a federal system such as the USA that programmes can become extended in terms both of causal chains and numbers of participating agencies. Anthony King argues that the capacity of British Government to deal with its problems is diminishing because 'the number of dependency relationships in which government is involved has increased substantially'.[3] Thus it is nowadays relatively rare for implementation of a public programme to involve only a government department on one hand and a group of affected citizens on the other. Instead there is likely to be an intervening network of local authorities, boards and commissions, voluntary associations and organized groups. An example of multi-stage, multi-agency implemen-

tation is the Glasgow Eastern Area Renewal (GEAR) project, involving as it does the Scottish Office, Scottish Development Agency, Scottish Special Housing Association, Manpower Services Commission, Strathclyde Regional Council, Glasgow District Council and several other public bodies—as well as community groups, the inhabitants themselves and the private businesses and investors who, it is hoped, will be attracted to the regenerated area. The question of whether or not GEAR is likely to achieve its aims is the subject of lively debate in Scotland.

Seventh, that there is complete understanding of, and agreement upon, the objectives to be achieved; and that these conditions persist throughout the implementation process

The theory of management is replete with references to objectives which, we are told, should be clearly defined, specific and preferably quantified, understood and agreed throughout the organization, mutually compatible and supportive, and provide a blueprint against which actual programmes can be monitored. Unfortunately most research studies suggest that, in real life, the objectives of organizations or programmes are often difficult to identify or are couched in vague and evasive terms. Even 'official' objectives (where they exist) may not be compatible with one another and the possibility of conflict or confusion is increased when self-interested groups proliferate their own 'unofficial' goals within a programme. Official objectives are often poorly understood, perhaps because communications downwards and outwards from headquarters are inadequate. Even if objectives have initially been understood and agreed, it does not follow that this happy state of affairs will persist throughout the lifetime of the programme, since goals are susceptible to succession, multiplication, expansion and displacement. Goal displacement occurs when there is substituted for the original or legitimate goal of a programme some other goal for which it was not created or when means become ends in themselves that displace the programme's true ends.[4] Any of these tendencies will complicate the implementation process and may seriously impede it.

Eighth, that in moving towards agreed objectives it is possible to specify, in complete detail and perfect sequence, the tasks to be performed by each participant

The difficulties of achieving this condition of perfect implementation are obvious. Also it is surely desirable as well as inevitable that there should be some room for discretion and improvisation in even the most carefully planned programme. But techniques such as network planning and control can at least provide a framework within which projects can be planned and implementation controlled, by identifying the tasks to be accomplished, the relationships between these tasks and the logical sequence in which they should be performed. As Albanese notes, however, 'if a network is to be useful it has to be an actual guide to behaviour'.[5] That is, its utility as a control device depends on the extent

to which a network is communicable, acceptable, feasible and credible. This involves a nice balance between flexibility (the network must be adjusted as the project develops in practice) and rigidity (an entirely flexible network would have little force as a means either of planning or control). Networking can be a powerful tool in achieving smooth implementation but one need not explain to this readership why even the most elaborate network is unlikely to achieve the perfection demanded by the eighth condition.

Ninth, that there is perfect communication among, and co-ordination of, the various elements or agencies involved in the programme

Christopher Hood argues that, for perfect implementation to be achieved, it would be necessary to have a completely unitary administrative system—'like a huge army with a single line of authority'—with no compartmentalism or conflict within it. He is not, of course, advocating such a system. And even to state this condition of perfect co-ordination is to know that, leaving aside questions of desirability, its attainment would be all but impossible within and among real-life organizations which are characterized by departmentalism, professionalism and the activities of many groups with their own values, goals and interests to protect.

Communication has an important contribution to make to co-ordination and to implementation generally. But perfect communication is as unattainable a condition as most of the others we have examined, for reasons which would require a separate article to themselves. While management information systems (MIS) can assist in matching information flows to needs, they cannot ensure that the resulting data, advice and instructions are understood as intended by the senders or, indeed, understood at all. Of all the conditions of perfect administration identified by Hood, few seem more difficult to achieve than 'perfect co-ordination between administrative units, perfect information concerning the situation in hand and the capacity to specify tasks or the content of one's orders unambiguously'.

Tenth, that those in authority can demand and obtain perfect obedience

The phrase 'perfect obedience' is again Hood's and he expands it to mean 'no resistance to commands at any point in the administrative system'. If there were any potential for resistance it would be identified (in a model of perfect implementation) by the system's 'perfect information' and forestalled by its 'perfect control'. In other words the final and possibly least attainable group of conditions of implementation is that those 'in authority' are also those 'in power' and that they are able to secure total and immediate compliance from others (both internal and external to the agency) whose consent and co-operation is required for the success of the programme. Every administrative practitioner knows how difficult it would be to achieve this condition of perfect obedience or compliance. Most of us would add that we would not want

to live in such a system. This is, perhaps, the point at which to repeat that we set out to explore the *idea* of perfect implementation (and its preconditions) rather than to offer it as an *ideal* to be pursued at all costs, including social and political costs.

When implementation involves, as it often does, innovation and the management of change, then there is a particularly high probability of suspicion, recalcitrance or outright resistance from affected individuals, groups and interests, especially if insufficient time has been allowed for explanation and consultation or if any previous experience of change has been unfortunate. We cannot (and should not) hope ever to be free from such resistance but we can learn a good deal about its nature and about the responses open to us from the study of individual, group, organizational and political behaviour. Thus the psychologist, sociologist and political scientist have at least as much to contribute to our understanding of implementation as have the programme designer, network planner and information systems analyst.

Conclusion

The above analysis suggests a checklist of questions which might usefully be asked by administrators taking responsibility for implementing a policy or an associated programme. Are there likely to be insuperable physical, political or other external constraints upon the programme? Will sufficient time and adequate resources be available? Will the necessary combinations of resources be available when required? Are any relatively inflexible stocks of resources likely to be in short supply? Does the policy seem based upon an adequate understanding of the problem to be solved? Do its underlying assumptions appear to be valid? Is the policy response perhaps over-elaborate, requiring too many links of assumed cause and effect to be forged? How dependent is the programme on getting the co-operation or consent of other agencies and powerful groups—and how many of them are likely to be involved? Are those who must participate in the programme all aware of, and agreed upon, its objectives? Does the programme have clear objectives to begin with, and are they compatible and mutually supportive, forming a 'hierarchy of intent'? Do clarity and consensus on objectives seem likely to persist throughout the programme? Have such aids been employed as are available to identify and sequence the detailed tasks needed to carry out the programme? Is the programme capable of being co-ordinated: is the will to act collectively present as well as the technical capability? What problems of maintaining effective information-handling and communication must be expected? What internal and external sources of potential resistance can be identified? Have we the power as well as the authority to secure compliance? Who are likely to see the changes demanded by the new policy as threatening to themselves and what can be done to meet their fears and, if possible, recruit their support?

This article has approached the problem of implementation failures

in what might be regarded as a slightly perverse way, by setting up an 'unreal' model of perfect implementation (based in part upon the approach developed by Christopher Hood) and then identifying equally unrealistic conditions which would have to be satisfied to achieve this theoretical state of perfection. The best way to solve a problem, however, is to try to think it through as fully and systematically as possible. It may be that, in asking why the 10 conditions of perfect implementation are rarely if ever achieved in practice, we have increased our understanding of what is involved in implementation, the reasons for implementation failure and the questions which should be asked by those concerned with improving the implementation process.

References

1. J. L. Pressman and A. Wildavsky, *Implementation*, University of California Press, 1973. Some of the other American writers referred to are A. Etzioni, *Social Problems*, Prentice-Hall, 1975; H. Kaufman, *The Limits of Organizational Change*, University of Alabama Press, 1971; Todd LaPorte (ed.), *Organized Social Complexity: Challenge to Politics and Policy*, Princeton University Press, 1975; and E. Bardach, *The Implementation Game: What Happens After a Bill Becomes a Law*, M.I.T. Press, 1977. For a useful survey of the American literature, see Donald S. Van Meter and Carl E. Van Horn, 'The Policy Implementation Process: A Conceptual Framework', *Administration and Society*, 6(4), 1975.
2. A. King (ed.), *Why is Britain Becoming Harder to Govern?* BBC Publication, 1976: see King's own essay 'The Problem of Overload' at pp. 8–30. See also his article on 'Overload: Problems of Governing in the 1970s', *Political Studies*, 23(2–3), 1975. C. Hood, *The Limits of Administration*, John Wiley & Sons, 1976.
3. A. King (ed.), *op. cit.*, p. 18.
4. For a useful discussion of goals, including goal displacement, see A. Etzioni, *Modern Organizations*, Prentice-Hall, 1964, ch. 2.
5. R. Albanese, *Management: Toward Accountability for Performance*, Irwin, 1975, p. 203.

The Impact on the User of the Microcomputer Revolution

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The article that follows is based on a paper which Mr. Marks presented at the 12th Conference of the International Council for ADP in Government Administration (ICA) in Helsinki, 19th–21st September 1978. —*Editor.*

Introduction

Technically, it is difficult to define a microcomputer, or a minicomputer for that matter; moreover, from a user's point of view, it is doubtful whether there is any practical advantage in attempting to. Perhaps micros can be most usefully thought of as big computers physically compressed to such an extent that their components are microscopically small. (Admittedly some parts, in particular storage, are not yet miniaturized to the same extent as others, but they probably soon will be.) What it is important for the user to appreciate is that, in terms of functional logic, micros are little different from previous generations of computer.

Nevertheless, the vast reduction in the physical size of a computer (complete with its ancillaries for input, output and data storage) from that which needed a large room in the 1950s to what can, in the late 1970s, sit easily on a table (or without ancillaries can be held in one's hand) offers users the first real chance of reassessing the way data processing work should be done. But since the fundamental logical design of a computer has changed very little, it follows that the essential nature of data processing is not likely to change in a revolutionary way (except, perhaps, in the literal sense of coming full circle); rather it will continue to be evolutionary, enabling us to carry out present tasks more effectively and to embark on entirely new areas of application.

The changing nature of data processing

The historical development of data processing was, until very recently, of progressively more powerful centralized computer installations

justified on the basis that the larger and faster the machine, the lower the cost of processing tended to be. Work had to be brought to the computer rather than the computer to the work: initially this was effected by physically transporting paper to and from the computer, more recently by allowing remote usage by terminals connected by telephone line. In some cases, where centralization of the work has been made necessary in order to obtain an economic return on computer expenditure, the total system requirement has not been satisfied—sometimes not even surveyed or analysed. In particular, human needs have been ignored or minimized when radical changes of organization and new procedures were introduced; this applies both to the end-user and to those who operate, or service, the system. Inevitably this has caused problems, very severe in some cases, which micros give us the chance of avoiding in future.

One of the great benefits of micros—perhaps in time it will be seen to be the greatest—is that it will gradually make obsolete the concept of the computer 'installation' with its pampered, expensive and closely controlled physical environment. Refined controls over temperature, dust, humidity and power supplies will be obviated and we can look forward also to getting rid of the present awful conglomeration of ingenious but retrogressive electro-mechanical devices. A computer can be placed where the work needs doing—typically on someone's desk—and in the process programmers, operators and maintenance engineers may disappear from the office scene. Not all of this, however, will be an unmitigated blessing, as will be seen.

The advent of micros does not portend the abandonment of all large centralized computer systems, whether they be for large-scale data processing or have large data-bases for information retrieval; but it does mean that we can seriously consider both stand-alone micro-systems of some power and sophistication and linked systems where such micros can be switched to communicate (in both directions) with a central system. In other words, hopefully, we can think again towards more 'natural' ways of doing administrative data processing.

The approach to systems design

The design of a good data processing or information retrieval system and the translation of relevant parts into effective computer programs are as demanding and rigorous processes with micros as with larger machines, and can be expensive. But the advantage with micros is that the developed program can be implemented in the hardware, and if a sufficient number of identical hard-programmed micros can be utilized effectively, a dramatic reduction in the unit cost of software is possible. Of course, a similar sort of opportunity presented itself with software packages on larger machines, but was not made use of as much as it might. With micros at present—and the situation may not remain so for long—the problems the end-user has in programming his own application, coupled with the relative ease with which it can

be pre-programmed by a special 'facility', lead one to hope that for some sorts of application there will be a forced trend towards economical pre-programmed microcomputers.

In terms of hardware cost the unit of computing power (taken crudely as some combination of memory size and arithmetic speed—or as the amount of useful data processing carried out for each penny or cent spent) has fallen and will continue to fall continuously, whilst the cost of human effort required to produce useful computer output—in particular that for systems design and computer programming—has risen and will continue to rise just as continuously. The introduction of micros does nothing to change this inverse cost relationship, though the novelty of the hardware tends to blind our awareness of it.

Before going on to consider the various types of possible micro applications, it is appropriate to review the general approach that should be taken towards assessing both the benefits and the likely problems. First and foremost it is important to remember that the cost of the hardware may be but a small part of the overall cost and that, as with other computers, the costs of (*a*) producing the software, (*b*) maintaining both hardware and software, and (*c*) operating the system, may be disproportionately large, though this is not necessarily the case. Some of the benefits may be easy to measure in cash terms, for example, if staff time is being saved, but comparisons with alternative methods of doing the work may be difficult or tedious. Nevertheless, unless the proposed application is trivial, a careful cost/benefit analysis must be carried out. This is especially important where the application is replicated in a number of sites, as will be developed later in this article.

Besides possible cash benefits, there are the intangible ones which are difficult to evaluate but should somehow be taken into account, such as the possible enrichment to the job of the clerical operator by having personally available mental 'leverage', or the exact item of relevant information and the improved service it may be possible to offer to the public.

Problems with microcomputers

Before a micro is purchased, the problems likely to be encountered must be squarely faced and plans made (and costed) for how they will be dealt with. Perhaps the biggest potential problem is reliability: micro-electronic hardware is inherently more reliable than its predecessors, but we have no guarantee that its design is 100 per cent accurate. Peripheral electro-mechanical devices are still as much an Achilles heel for micros as for the big computer—more so, perhaps, because the pressure is to produce them down to a price which may have meant cutting corners in terms of reliability. Suppliers may not be prepared to undertake servicing and maintenance of hardware—or of programs embedded in the hardware—and, indeed, they may not even be in business when the break occurs. There is the problem of the user even knowing when the micro is not working properly—if, for

instance, there is an intermittent fault in the hardware or a logical error in the software which only occasionally manifests itself. Special diagnostic software and special electronic test equipment may be required to check whether equipment is working properly and to locate faults. Replacement of the micro may often be more economic than attempting repair, because of the difficulty in locating and mending faults in such a complexity of miniscule components; this may mean holding reserve stocks. The correction and up-dating of software—especially where this has been 'wired-in'—add a new dimension to the maintenance problem. Against this background, it may be that administrations should be thinking of the necessity of having some sort of central micro facility to which their users could look for technical support on both hardware and software.

At the operational level a number of problems may present themselves because of the fragmentation of processing. If data is being directly input, the user, who may no longer be a specialist operator, may be inefficient, his productivity low and he may make mistakes. Procedures must be introduced for error detection and correction; alternatively tolerance of degrees of error must consciously be accepted. New possibilities for fraud are opened up and ways of combating them must be thought out in advance. Clearly auditors must be involved in the early planning stages for micros as for other equipment. Similar problems will have to be faced in the areas of privacy of data and security of systems, where 'fragmentation' may increase risks significantly. On the other hand the security risks of having all the eggs in one basket are diminished.

Categories of microcomputer applications

Since some considerations do not apply to all types of applications, it is vital to distinguish between them. Four separate categories of processing can be identified, namely those which are:

(*a*) Self-contained and standard.
(*b*) Self-contained and replicated.
(*c*) Self-contained and one-off.
(*d*) Part of a bigger system.

Self-contained and standard applications

By this term is meant the sort of applications which are standard not just within government but are also to be met in commerce and industry. Among the most important of these are those handled in the past by 'accounting machines' of various types, but more recently by computers, such as invoicing, stock control and wages compilation. More recent specialist developments are in the areas of word-processing and the compositing and editing of printed publications.

A great deal of development and innovation is being carried out by commercial enterprises who are competing to supply complete 'kits' to carry out a variety of standard data processing functions. The great

advantage from the user's point of view is that the price quoted covers both hardware and software, so that there is no hidden large overhead. He can see and test exactly what he is buying and there is active competition between suppliers. Accordingly, if the government user can be sure that the standard product fits his requirement, the off-the-peg packaged micro can be an economic and satisfactory solution. But against the background of a very active market-place it is necessary to shop around and to buy, rather than be sold, the right product. And before buying it should be tested in the real work situation, not the sales situation. Reliability and maintenance—and the continued existence of the supplier for support services—are also important factors to be considered.

Self-contained and replicated applications

These are applications which are standard within an area of government administration, but are not generally to be found in commerce or industry. In these cases special software will have to be produced (and maintained) and the extent to which this will be economic will depend on the number of machines over which the cost can be spread. This is the area to which most attention has been paid in the United Kingdom and on which the Microcomputer Workshop of the Central Computer Agency has been concentrating.

Clearly the technical limitation of micros has to be taken into account when considering applications. Currently they are relatively slow and have quite small resident program capacity and data store. This points towards relatively simple data processing with small data files, and avoiding operations such as sorting; also one user at a time rather than multiple ones. Jobs that are input/output intensive and may involve interactive working (e.g. interrogation of a simple data-base by a user) look likely candidates. Some possible applications—though there will be many others—are thought to be:

(*a*) Registries and libraries: recording, indexing, tracing, bringing forward.
(*b*) Personnel records: local records and directories (perhaps sub-sets of central records, such as the United Kingdom's PRISM).
(*c*) 'Counter' applications in such places as post offices, tax offices and Social Security offices, enabling automatic calculations to be undertaken from a combination of the algorithms of the regulations and locally available data.
(*d*) Teaching/training: self-instruction using micros interactively.
(*e*) Information retrieval using small data-bases.
(*f*) Project control networks.
(*g*) Feature card applications: attribute matching and selection.
(*h*) Client (or patient) 'interviewing', using micros interactively.

It is important that administrations start actively to look for applications in this category which offer the greatest potential benefit,

otherwise development will take place piecemeal and there will be waste of effort and duplication. People love inventing their own wheel! If such applications are identified, it is necessary to consider the setting up of a technical facility to undertake the necessary systems and programming work, the procurement and distribution of the equipment and its maintenance—both in terms of operational serviceability and in keeping programs up to date with changing circumstances.

Self-contained and one-off applications
Typically, under this heading, is the case of the scientist or engineer who needs a micro to do a particular range of calculations where he himself will do the programming. The cost of the micro is likely to be trivial in relation to the value of time saved and the cost/benefit ratio easy to establish. Also, it will not be difficult to assess an alternative method such as using a terminal to access a computer bureau. It may have to be accepted that the user may spend a disproportionate amount of time on programming a micro in (currently) a relatively crude way and that some people will treat micros as personal toys. But, in general, users may be expected rapidly to educate themselves in the effective use of these devices and should be encouraged rather than discouraged.

Applications which form part of a larger system
These are applications which on the surface appear to be self-contained but are really part of something bigger. Typically they may be the peripheral points of a 'distributed' system where more than one level of data-base is maintained and more than one level (or type) of data processing carried out. It may, indeed, be difficult to perceive at the outset—and from the user's description of his requirement—that only a small part of a system is in view and it is necessary, therefore, that Management Services staff, who in general will be first on the scene, are trained to ask the right questions so as to be able correctly to assess the situation.

In some cases micros could be operating in dual mode: part of the time operating as self-contained machines taking in and processing data and producing results locally, part of the time transmitting to other computers summary information which has been produced, or receiving from them data needed for local processing. There could be applications of this sort in the tax, social security expenditure/budgeting, personnel and employment fields, but each would need major feasibility study of the complete system by specialist teams.

The systems approach
Having outlined the four types of application, it must be emphasized that in all of them the 'systems approach' must be taken. That is to say, not just that part of the system represented by its electronic component but the complete man/machine system; in particular, human factors must be given a great deal more weight than they have in past

designs of computer systems. Against this background, and considering micros in their main foreseeable role as giving computer 'leverage' to the man at his desk, we should not simply aim for mechanical (or electronic) efficiency as an end in itself, but have as our objective how the micro can best be harnessed to enable him, using his human talents and abilities, to do his job more effectively and with more satisfaction to himself. Study of the system from this point of view will, besides covering fundamental considerations like centralization versus decentralization, also take seriously into account the sort of information retrieval or calculating facilities the user would like to have at his elbow, what operations he would like to do for himself and what is the best method of man/machine communication.

Social issues

A major social question is whether the widespread introduction of micros in offices will result in unemployment—particularly, for instance, their use in word processing. I can only speak as an individual but I certainly do not believe that they will have this effect. The use of office machines, starting with the typewriter and telephone in the late 19th century, going on to calculating and copying machines in the early 20th century and electronic computers since the 1950s, has all led, so far as I am aware, to increased employment, simply because so much more office work has become necessary. It could be argued, I suppose, that without these inventions much larger numbers of people could have been employed to do the work 'by hand', but I think that the more probable consequence would have been that the work simply could not, or would not, have been tackled. I believe that the volume of data/information processing and communication will continue to grow as the processes of trade, industry and administration grow and become more interrelated and complex, and spread to new areas; that this will demand exploitation of technical development and will not create unemployment, though undoubtedly it will change the way work is done. Obviously this is belief and not knowledge, but I am not aware of any factor likely to reverse the historical trend.

Conclusion

Pressure for the introduction of micros is going to be very great, both from suppliers and potential users. However, whilst enormous benefits are likely to derive from their sensible application, indiscriminate and wholesale distribution of these devices could be expensive and counter-productive. On the whole it is likely to be Management Services rather than computer staff who will have to cope in the first instance with the onslaught, bringing them firmly back into this area of office mechanization for the first time in a generation. They will not need to know a great deal technically about micros, but they will need to develop a knowledge of likely applications, to be able to discriminate between the sensible and the *outré*, to be able to recognize the basic character of

the application as analysed in this article and to know when to involve specialist computer staff. Management Services and computer staffs will have to work much more closely together than, in some places, they have been accustomed to. Thus, hopefully, micros may act as the catalyst towards reversing the trend of the computer and Management Services men going their separate ways, to the detriment of the 'systems approach'.

Finally, if the microcomputer revolution is to be fully and effectively exploited, it is clear that a major systems training effort will be necessary—as a matter of some urgency—to enable people not only to grasp the nature of the technical developments which are taking place but to understand how these are likely to change our concepts of computer usage.

Civil Service College results in British Computer Society examinations

Directorate of Systems Training entered 82 students for the April 1978 BCS Part I examinations and they achieved a success rate of 96 per cent (in terms of papers taken) compared with the national rate of 66 per cent.

All students took the DST 'sandwich', or modular type, courses, with relatively short periods of attendance at the College interspersed with longer periods of directed study and project work back with their departments. This method of study, pioneered by DST, is growing steadily in its popularity both with students and line managers since it does not involve extensive loss of contact with home and job. It was extended in 1977/78, under DST sponsorship, to North Staffordshire Polytechnic where, of the 22 papers taken by 11 Civil Service students, only one was failed.

In addition, a small number of students took external full-time courses sponsored by the College at London School of Economics, the City University and North Staffordshire Polytechnic, of whom six were successful in passing examinations leading to exemption from BCS Part II.

The overall picture is that 102 Civil Service students passed; only nine failed and these were confined to single papers in Part I which can be re-taken in April 1979.

Details of professional level computer training undertaken and sponsored by the College are sent to departments annually in Central Training Notices: courses available for 1978/79 were listed in CTN 77/62 dated 19th December 1977 and CTN 78/30 dated 12th April 1978.

The O and M-er— A Different Perspective?

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—*Editor.*

Introduction

As organizations expand in size and complexity they tend to make greater use of specialists. These vary from those highly focused in one particular field, e.g. accountancy, work study, computer systems, to those giving more general help, e.g. those who are concerned to help management or the organization solve particular problems or effect changes necessary for the greater achievement of goals. All may be brigaded together under the generic term 'consultants'.

Partly because of a growing disenchantment with panacea-like packages and techniques and partly because 'consultants' themselves recognize that the implementation of their recommendations will be successful only if people willingly accept the changes proposed, there has been a movement to a broader type of consultancy which 'generally can be classified as those optimizing human and social improvement or as those optimizing task accomplishment or more likely as some (often confused) blend of the two'.[1] Consultancy in this form is likely to lead the practitioner to adopt a wider variety of roles than the more highly focused versions.

After describing the phases involved in the consultancy process and some of the differing styles that consultants can adopt, this article will examine some of those roles and the qualities and skills required of a consultant operating within them. Regard will be paid to similarities and differences between internal and external consultants.

What is a consultant?

The Institute of Management Consultants defines a consultant as 'an independent and qualified person who investigates and identifies management problems concerned with policy, organization, procedures and methods; recommends appropriate action and helps to implement the recommendations'. However, most of the literature defines a consultant in terms of the relationship between the consultant and the client. For instance, R. Lippitt gives as a definition of the consultant and consulting relationship: 'A consulting relationship is usually a

voluntary relationship between a professional helper (consultant) and a help-needing system (client) in which the consultant is attempting to give help to the client in the solving of some current or potential problem—and the relationship is perceived as temporary by both parties.'[2] Argyris prefers the term 'interventionist' and talks of 'entering into an on-going system of relationships, to come between or among persons, groups or objects for the purpose of helping them'.[3] Another common term for a consultant in the literature is 'change-agent', defined to include anyone, inside or outside the organization, who tries to effect change.[4]

The two common themes that run through the literature are help and change. A consultant could, therefore, be defined as someone, with relevant training and experience, who is concerned to help managers and staff to change behaviours within the organization, perhaps through changes in task, technology, structure or processes, in order to solve or prevent a particular problem. I introduce the word 'behaviours' because, while agreeing with Argyris that change *per se* is not the primary task of a consultant, change, at least in the behaviour of members of the client system, is inevitable if a problem is to be solved or avoided or if development is to take place.

Lippitt goes on to state that 'the consultant is an outsider', i.e. not a part of any hierarchical power system in which the client is located. But later a reference is made to internal consultants being 'psychological' outsiders, in the sense that they see themselves and are perceived to be outside the sub-system they are trying to help while still being members of a wider organizational system.[5] Swartz defines an internal consultant as: 'A helper (professional or non-professional) who is considered a member of the client system or a closely related system'; and an external consultant as 'A helper (usually professional) who has minimal or no organizational/political relationship with the client system.'[6]

Phases in the consultancy process

Most of the literature reflects increasing agreement that consulting relationships need to go through a number of identifiable phases to be effective. This, despite observations like Farson's: 'It's an extremely frustrating situation, and it has led me to the conclusion that anything works. That is, any well-intentioned disruption of the existing system can produce constructive change.'[7]

Statements of these phases vary, but they are all largely encapsulated in the work of Lippitt and Lippitt[5] who identify four which comprise:

(1) Contact and entry—'the initial exploration of a potential consulting relationship'—e g. a preliminary survey during which the need for help is identified and clarified; the readiness to change is explored; and the likelihood of an effective relationship is tested.

(2) Contract formulation—moving toward 'some kind of agreement about the nature, objectives and conditions of a working relation-

ship'. This agreement will include statements of the desired outcomes; who would need to do what; time constraints; the accountability of both parties; and evaluation procedures.

(3) Planning for problem-solving—after more intensive diagnosis, refining goals and selecting from alternative possibilities specific action steps, determining involvement of whom, in what way, and processes for evaluation and feedback.

(4) Action-taking and continuity—the implementation of plans, evaluation and feedback on the basis of which any revised action steps are decided and follow-up support arranged so that the formal relationship may be terminated.

Consultancy styles

Before looking at the roles involved in these phases, I should make some reference to consultancy styles. A helping relationship itself implies a set of values likely to result in an approach centred round the needs of the client. Nevertheless, experience shows that consultants can be distinguished by their different styles which suggests that a client-centred approach is not always paramount. We have to recognize, therefore, that any consultant is likely to have one predominant style with which he is most comfortable and consequently most likely to adopt, but an *effective* consultant is one who is able to adopt different styles at different phases and with different clients. These different styles are commonly described as forming a continuum of consultant behaviour or roles.

Schmidt and Johnston[8] describe a continuum characterized by client-centred interaction at one extreme and consultant-centred interaction at the other. 'Each behaviour reflects a different mix of the client-consultant experience being brought to bear on a given problem.' At the client-centred extreme the consultant refuses to become involved while at the other extreme he prescribes and plans the implementation (or ultimately might even become the manager himself).

Lippitt and Lippitt[9] describe a continuum from more directive roles to more non-directive ones. In the directive role the consultant takes the lead and initiates activity, whereas in the non-directive role merely provides data for the client to use or not. 'These roles are not mutually exclusive.'

Research by Tichy,[10] however, casts doubt on the degree to which the roles are in fact 'not mutually exclusive'. He suggests that even though Organizational Development consultants claim to be client-centred and non-directive, they each have a general change model which determines their particular diagnostic framework. This leads to a tendency to concentrate diagnosis on particular areas, use of the same intervention strategy and prescription of the same sort of solutions in each different consulting relationship. It is this tendency—expressed as inadequate diagnosis—that is being identified as a prime cause of failure in unsuccessful client-consultant relationships.[11,12] As more

research into the factors that lead to success or failure in consultancy is published, the roles and skills necessary for effective consultancy will become established. While still a comparatively uncharted field, sufficient research has been published for me to explore possible roles.

Consultancy roles

To bring some sort of order into the variety of possible roles, I will attempt to highlight those most likely during each different phase of the relationship. As the consultancy process is a dynamic one, however, roles will not be specific to just one phase. Indeed, as consultants move about an organization it could be argued that they enter into a number of separate client-consultant relationships with a number of different individuals, groups, or sub-systems. For example, they must inevitably enter different relationships with managers, staff, trade unions, etc.

Contact and entry phase

Using the Lippitt model above, the first phase is *Contact and entry*. In terms of his role there is something of a conflict for the consultant at this stage. On the one hand he has to mix the role of expert or advocate, in that he has to some extent to sell himself as a helper, with the role of educator, to the extent that he has to establish the need for help and expose the consequences of not changing. On the other hand, he has to model the way in which he will predominantly operate during the relationship and this implies more client-centred roles, such as collaborator and listener.

It could be argued that internal consultants are at an advantage in making initial contact. They are in the unit, are known to potential clients, and are likely to be less expensive; they will be aware of difficulties and problems within the unit, and thus able to make more specific approaches—finding it easier to help identify and clarify the need for change. Against this it may be more difficult for potential clients to admit to someone within the unit that they have a problem and need help; the consultants may be seen as acting in an inspectorial role for top management; may be mistrusted because of organizational politics and rivalries; or, indeed, may be inhibited by known constraints or even be part of the problem themselves.

This gives external consultants the edge in that they are likely to be perceived as more credible than internal ones. Not only can the outsider conceal failures (whereas any difficulties experienced by the insider, even if only temporary in the course of a relationship, will be well known) but assumed experience of other organizations gives them an aura of greater expertness. Clients even appear to prefer outsiders because their unfamiliarity with the culture of the system can be used as an excuse for not taking responsibility for or not being committed to change.

Another major disadvantage for internal consultancy groups is that they are usually tied by the position held within the system. It is, for

example, common for internal units to be placed some way down the organizational hierarchy. This can affect credibility with higher status clients especially in more rigid bureaucracies found, for example, in those government departments which place heavy emphasis on formal authority structures. External consultants who are more likely to have access to and be respected by higher-level managers have the advantage because effective change programmes require commitment and often management from the top.[13,14]

This phase also provides the opportunity to explore the potential for working together. The client, because of familiarity with the internal consultant, may have stereotyped preconceptions which are incorrect. He may also be less willing to work with the insider because of perceived difficulties in terminating the relationship against the relative ease of ending a contract with an outsider. The internal consultant may feel less able to reject the assignment—especially if it has been imposed on him by his own superiors—whereas the external consultant can always withdraw if he does not feel that a relationship with the client will be productive, if the client is not ready for change or if his 'gut says "no"'.[6]

Contract formulation phase

The second phase is *Contract formulation*. In determining the desired outcomes of the relationship the internal consultant may perceive more easily the feasibility of or need for particular outcomes while the outsider, because of his accepted broader experience, is better able to question and invoke the wider perspective that may be necessary.

In arriving at the likely programme of activities—who will be involved, at what stage and the time limits—the consultant will need to adopt the role of planner. This leads to a more directive stance because the client may not have experienced such a relationship previously (certainly less often than the consultant). Nor would the client be likely to have knowledge of the time-scales of proposed activities.

Here the advantage lies with the internal consultant. Because of the time that can be devoted to the client, a more tentative plan of activities can be drawn up giving the appearance of a more client-centred posture. (But this could, in the long term, make termination more difficult.) Also, because the outsider's time is likely to be limited by cost and his future security depends upon successful results, he may exert pressure to be more directive and more consultant-centred. Nevertheless, the independence of the situation often means that he can adopt a more objective and confronting approach than the internal consultant who, dependent on the system for career progress, might leave important areas untouched, might not confront defensiveness in the client or tackle other important issues.

Planning for problem-solving phase

The third phase is the main diagnosis and decisions on action to be taken

towards the achievement of the agreed outcomes. This is, perhaps, the most critical phase for the consultant when involvement is most intense. A range of both directive and non-directive roles will be called for.

Directive roles may include:

(*a*) *Diagnostician or fact finder.* Depending on the size of the unit, the complexity of the problem and the time constraints, the consultant may be called upon to provide specialist skills in data collection, such as survey design and data analysis. There is a dilemma at this point of an intervention. The consultant provides the unit with two important things: time and objectivity. Managers and staff continue to perform their normal functions while diagnosis takes place, and because they are close to the problems they may not recognize important facets or may interpret information incorrectly. By taking an expert role in diagnosis there is a danger that the consultant will reduce the chances of the long-term success of the intervention because of reduced commitment on the part of the less involved client. If one accepts Argyris's intervention model of generating valid data, and giving the client a free and informed choice in order to create internal commitment, then the way in which the data are fed back to the client and interpreted becomes crucial. Argyris argues that data should be fed back uninterpreted and without evaluation so that the client can interpret them for himself. This is not to deny the consultant a collaborative role in interpretation. Bowers and Franklin[15] describe the primary role of the consultant at this point as 'that of a transducer (i.e. an energy link between scientific knowledge regarding principles of organizational functioning and the particular organization or group with which he is working)'. The consultant needs to provide the client with a model against which the data can usefully be interpreted and what needs to be done determined. This model may define a healthy organization[16] or be a relatively simple statement of the conditions and criteria for effectiveness. In this sense the consultant is once again acting as an educator as he was in the first phase.

(*b*) *Process specialist/observer.* This is a consultant-centred role, i.e. it is a specialist role (the viewing and analysing of an individual's or work group's functioning or process is a particular form of diagnosis). As such the degree of directiveness is dependent on the way in which the data are fed back to the client.

(*c*) *Technical specialist.* From a basis of wider experience and knowledge the consultant helps the client to examine and weigh alternative solutions or courses of action. This is a directive role in the sense that the consultant directs the client to assess possibly more effective solutions—going so far as to recommend a certain course of action as a partner in the decision-making process. In helping the client to weigh the alternatives, so that he himself can make the final

choice, the consultant will ensure that the likely consequences of each are considered and may at the same time provide analytical techniques to aid assessment.

(*d*) *Planner*. Because of previous experience and knowledge of the most effective way of carrying out certain activities, the consultant may take a major part in planning both the sequence of activities and who should be involved. Tools to help the process, and methodologies to aid evaluation may also be provided.

Non-directive roles may include:

(*a*) *Catalyst*. A catalytic role is the most likely at the early stages of diagnosis when the aim is to help the client establish what the problems are and begin to formulate ways of overcoming them. In adopting this role the consultant will listen, reflect back, clarify, act as an empathic responder *and* act as an integrator by helping the client to piece together bits of information to form patterns or trends.

(*b*) *Linker*. This is a term used for 'someone who knows about resourcers, knows about people's needs, and knows how to bring clients and resourcers together'.[17] This role is client-centred rather than consultant-centred because the intervention is not restricted to those areas or skills which the consultant can provide, but includes establishing links with other sources of help to bring a broader range of options to the client.

Action-taking and continuity phase

The final phase in the model is that of action-taking and providing for continuity. Among the roles involved are:

(*a*) *Trainer*. Here the consultant is acting very much as a specialist providing training using a variety of methods. These might range from giving formal conceptual input to existing or new courses (directive), through structured team-building exercises, to non-directive sensitivity or interpersonal skills training. To achieve a successful outcome to the relationship and to ensure continuation of improvement, the consultant is concerned to develop skill, competence and potentiality in the client unit.

(*b*) *Counsellor*. Having assisted the client in the process of decision-making in the previous phase the consultant supports the client in carrying out those decisions. Carrying through decisions about change often entails a burden of responsibility that can be too great to carry alone. Other members of the sub-system may be affected by the change and asking for help may be interpreted as weakness by colleagues, or colleagues may not have the time to give the kind of personal support necessary, thus forcing those in a change situation into a position of isolation. The consultant's role is to provide support by reinforcing constructive changes, helping over setbacks and building on successes achieved.

(*c*) *Manager of change.* Here the consultant is not managing the activities but managing the process of change to the new system, by helping to monitor progress, to take stock and to make any necessary changes to the planned sequence of activities—perhaps the role can best be described as that of evaluator. Throughout this phase the internal consultant is better and more economically able to carry out a more continuous observation of activity and to assess the necessary skill levels and needs for skill development. Against this, parts of the unit may try to hide emerging problems but, to the extent that these problems may be emerging in different sub-systems than that which is the main focus of activity, the internal consultant may be able to follow through the implications of change and enter into new consulting relationships more easily than the outsider. The external consultant, on the other hand, may be in a better position to gather appropriate people for analysis sessions, may more easily terminate the relationship and, with this in sight, be more successful in ensuring the development of skills within the unit to provide continued support.

In general

Throughout the relationship the consultant should model the behaviour that he hopes the client will adopt. That he should practise what he preaches and behave in a way consistent with his values is fundamental to the process of learning by the client. Experience shows that people learn more from behaviour than from words. This part may be an easier one for the external consultant to play because he is not a part of the unit and therefore not subject to pressures to adopt its values. Furthermore, the very fact that he is not well known to the client is an advantage in terms of status.

As suggested earlier, the roles do not fit neatly into compartments in the phases of the consulting process, because the process is a dynamic one. The order does not reflect, for example, the selectivity and flexibility that is necessary for a consultant. As Schmidt put it: 'There is a time to confront but also a time to reduce tension. A time to use power but also a time to use persuasion. A time to act but also a time to diagnose. A time to accelerate change but also a time to slow it down. A time to intervene but also a time to refrain from intervening.'[18]

Knowledge and skills of the consultant

From the identification of some of the major roles of consultants I can go on to outline the required characteristics and skills. Until recently these skills were thought to be inherent or attainable only by practice, and therefore training programmes were not designed to teach them. Further, a complete list of skills needed to carry out all the roles would read like a prescription for the Archangel Gabriel. As Vaill comments: 'It is difficult to describe these skills and abilities, and at the present time it is quite impossible to say how to train men to practise them.'[19]

Knowledge

It is important for a consultant to have and to be able to impart to clients a model of people's behaviour at an individual, a group and an organizational level. This is implied in the role of 'diagnostician' or 'transducer', and is implicit in the role of 'trainer'. It is also partly from this knowledge that the consultant will derive and clarify the values which will determine how he will conduct himself in his consulting relationship.

Three particular aspects of behavioural science knowledge seem to be important:

(*a*) *Knowledge of the change process.* Without this knowledge intervention is liable to be haphazard and in danger of creating too much dependency, thus failing to achieve a self-sustaining organization improvement.

(*b*) *Knowledge of the learning process.* Since one of the aims of the relationship with a client is to develop the skills and abilities of members of the client system, a knowledge of the learning process, particularly experience-based learning, is essential.

(*c*) *Knowledge of power within organizations.* Many of the problems faced by internal consultants have to do with organizational politics and the constraints placed on them by their membership of a formal power system. Although Pettigrew[20] considers that the 'political context of the interventionist's work' is neglected in much writing on organizational change, most practising consultants are aware of the importance of power and the need for diagnosis in this area.

Skills

(*a*) *Interpersonal.* Since I have defined consultancy in terms of a helping relationship dealing with people, interpersonal skills predominate over other necessary skills, such as diagnosis and planning, and provide the foundation for them. Within this category the catalytic and counselling roles have a major place. There is much that a consultant can learn from the field of individual counselling. Traux asserts that an effective counsellor brings three elements to his role: unpossessive warmth, genuineness and empathy.[21] Empathy means being able to listen attentively to both verbal and non-verbal messages and to understand how the client feels and what he is saying. More, this understanding must be communicated by mirroring or reflecting back feelings. It must be accurate and non-evaluative but may make connections between seemingly isolated statements or feelings. Egan also highlights empathy and pinpoints skills in listening and giving and receiving feedback as fundamental means of displaying empathy.[22] Of equal importance is dealing with group processes. Schein states that a consultant's 'expertise may go beyond these areas, but it must at a minimum include them'.[23] Lippitt and Lippitt sum up the area of interpersonal skills

for consultants as 'being able to communicate and deal with people in an atmosphere of tact, trust, reality, openness and with goal orientation'.

(*b*) *Diagnostic.* Schein suggests the need for skills in data-gathering in three basic areas: direct observation, individual and group interviews, and questionnaires (or some other survey instrument to be filled out). Diagnostic methods, ranging from observing group processes through to large-scale survey-feedback methods, will vary with each intervention. Linked to diagnosis are skills in giving feedback to individuals or groups in a way that will enable the recipient to learn and develop. This means giving feedback that is 'concrete, descriptive, verifiable, timely and specific' in a manner that shows sensitivity to the client.

(*c*) *Presentational.* Oral and written presentations have to be made at various stages during the consultancy process. The two most obvious instances are in a formal training role and when presenting feedback to groups of clients. But presentation is also important in the initial stages of making contact and gaining entry, particularly for the internal consultant in trying to establish credibility within the system.

(*d*) *Planning.* To the extent that consultants act as a link between the client and various other resources or between different parts of the client system, they act as the focus for the change effort. The demonstration of planning skills is necessary to facilitate developmental activities, and to co-ordinate and monitor different activities to increase the likelihood of a successful outcome.

Conclusion

Within the Civil Service a start has been made on developing a consultancy course orientated towards the internal environment (as far as this is possible, given the wide variety of departments covered). The early experiments were described in the August 1976 edition of this journal.[24] I believe this to be a very promising start and look forward to the day when all the different types of consultant operating within the Civil Service attend the course as part of their basic training.

In presenting this view of the nature of consultancy I have drawn heavily on the academic literature. It so happens that this largely reflects my own experience as a psychologist working in the Management Services Division of the Civil Service Department. Both the Editor and I would welcome comparisons with readers' experience or alternatively their views on the usefulness of articles of this kind to provide new insights as to the nature of their task or, where such insight has been developed, against which to measure themselves.

References

1. 'Organization Development' by F. Friedlander and D. L. Brown, *Annual Review of Psychology*, 1974.
2. 'Dimensions of the Consultant's Job' by R. Lippitt, *Journal of Social Issues*, 15, 2, 1959.
3. *Intervention Theory and Method* by C. Argyris. London: Addison-Wesley.
4. *The Planning of Change* by W. G. Bennis *et al.* New York: Holt, Rinehart and Winston.
5. 'Consulting Process in Action' by R. and G. L. Lippitt, *Training and Development Journal*, May 1975.
6. 'Similarities and Differences of Internal and External Consultants' by D. H. Swartz, *Journal of European Training*, 4, 5, 1975.
7. *Paradoxes in Consulting with Community Organizations* by R. E. Farson. Paper at the American Psychology Association, 1966.
8. *A Continuum of Consultancy Styles* by W. H. Schmidt and A. V. Johnston. Personal communication, 1975.
9. 'Consulting Process in Action' by R. and G. L. Lippitt, *Training and Development Journal*, June 1975.
10. 'How Different Types of Change Agents Diagnose Organizations' by N. M. Tichy, *Human Relations*, 28, 9, 1975.
11. 'Developing a Successful Client-Consultant Relationship' by C. H. Ford, *Human Resource Management*, Summer 1974.
12. 'How to OD (1)' by D. R. Tranfield, *Industrial Training International*, May 1973.
13. *Organization Development: Strategies and Models* by R. Beckhard. London: Addison-Wesley.
14. 'Patterns of Organizational Change' by L. E. Greiner, *Harvard Business Review*, 45, 1967.
15. 'Survey-guided Development: Using Human Resources Measurement in Organizational Change' by D. G. Bowers and J. L. Franklin, *Journal of Contemporary Business*, Summer 1972.
16. *Data Feedback and Organization Change in a School System* by M. B. Miles *et al.* Paper at the American Sociological Association, 1966.
17. *The Change Agent's Guide to Innovation in Education* by R. G. Havelock. Published by Educational Technology Publications, 1973.
18. *Organizational Frontiers and Human Values* by W. H. Schmidt. London: Wadsworth, 1970.
19. 'Organization Development: Ten New Dimensions of Practice' by P. B. Vaill. Published in *Optimizing Human Resources*, G. L. Lippitt, L. E. This and Bidwell (Editors). London: Addison-Wesley, 1971.
20. 'Towards a Political Theory of Organizational Intervention' by A. M. Pettigrew, *Human Relations*, 28, 3, 1974.
21. 'Therapist Empathy, Genuineness, and Warmth and Patient Therapeutic Outcome' by C. B. Traux, *Journal of Consulting Psychology*, 30, 1966.
22. *The Skilled Helper* by G. Egan. Monterey: Brooks/Cole, 1975.
23. *Process Consultation: Its Role in Organization Development* by E. H. Schein. London: Addison-Wesley, 1969.
24. 'Training Management Advisers' by M. A. Doncaster, *MSIG*, August 1976.

Managing a Hundred Programmers

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Introduction

Any reader staying the course to the end of this article and concluding that he has not really been told how to manage 100 programmers will, I am afraid, be fully justified in taking the view that the title constitutes an infringement of the Trade Descriptions Act. While the author rejoices in the title of 'Programming Manager' at a large computer installation at Hastings, he would not claim, literally, to manage 100 programmers.

As anyone who has had anything to do with managing programmers knows, the only recipe for success—even with just one or two—is to provide an environment in which they can do good, effective work with the minimum of supervision and restriction. In most cases it is not programmers who are managed but projects. Programmers are certainly one, very important, resource required in ADP project development and maintenance. Given a wide variety of projects and an even wider variety of people, all centred on a single multi-mainframe installation, it is unavoidable that an element of overall control has to be exercised if chaos is to be avoided. While the programmers of Computing Division could, for some purposes, be regarded as a single resource, it would be perilous to overlook the fact that this resource consists of 100 individuals from whom individual contributions are required—albeit within the framework of a benign discipline radiating outwards from the installation itself.

Given these conditions then, how does a Programming Manager—with, incidentally, responsibilities for in-house systems software, programmer training and some applications programming of his own, set out to discharge his terms of reference, which include, among other things, the establishment of codes of practice, the improvement of techniques, the setting of yardsticks for programs production and the career development of individual programmers? How, at the end of the day, are criteria for success to be determined? This is particularly difficult when little actual project development is going on and the measure of success or otherwise of the programming function is related

more to the level of client satisfaction with a continuing service than to the number of brand new effective programming language statements produced and tested.

One important criterion is the intangible feeling of technical pride in the efficiency with which all aspects of the computing service are provided. In some cases, notably improvements in throughput of the machine itself, these are susceptible of direct measurement. Mostly, however, they have to be assessed rather in the way that the admiral runs his rule over a warship during inspection. Does it look and feel like a well-run ship? What is morale like amongst the crew? Above all, how does the ship perform her allotted tasks?

This article discusses these questions—and the way in which they have been tackled at Hastings—under a number of headings, namely, Organization; the Chief Programmers Conference; Standards; Training; Communications and feedback. It will inevitably concern itself with the Programming Manager's (the author's in other words) job; how he sees it, and how he tries to set about doing it.

The organization

So far as the bulk of programmers in Computing Division are concerned, the organization is project, rather than functionally, based. Programmers report to Project Managers concerned with specific clients' areas and this, of course, makes the Programming Manager's task that much more difficult. If all 100 programmers were herded together in one room, he might just have a chance of really getting to know what was going on. But as they are scattered, both physically—the Division has branches in Croydon, Bristol and London, in addition to Hastings—and organizationally, other means have to be found. Thus it is that in each project-based branch there is to be found one SEO, with a programming background, who has been designated as the Chief Programmer for that branch. In some branches all the programming resource is concentrated under the management of the Chief Programmer. In others he acts as a project manager among other project managers but with special responsibilities for the co-ordination of technical advice, etc., to all the programmers in the branch. In short, he is the *de facto* representative of the Programming Manager for the programmers in that branch. (It should be noted that our Chief Programmers are not the same as those defined in IBM's Improved Programming Techniques concept in that they do not normally write programs themselves.)

The main responsibility of the Chief Programmer, so far as the Programming Manager is concerned, is to provide liaison and feedback for a number of purposes connected with the latter's objectives:

(*a*) The production and refinement of general local utility software (including that required to enforce local standards where this is necessary, for example, on security of files and amendment procedures for operational programs).

(*b*) The identification of individuals for particular posts, for example, in software itself, as training course advisers, for systems analysis work or in support of professional people.
(*c*) The development and improvement of basic in-house programmer training.
(*d*) The identification of further programmer training requirements in advanced techniques, new languages, the use of packages, etc.
(*e*) Information about general and specific applications problems and solutions which might have wider relevance and interest within the Division or, indeed, outside of it.
(*f*) The effectiveness and acceptability of existing and proposed new programming standards; proposals for new standards.

The Chief Programmers Standing Conference

To bring all these threads together and facilitate the achievement of the Programming Manager's objectives, a standing conference of Chief Programmers meets monthly. Senior representatives of the Operating and Control sides of the installation attend these meetings and report on installation matters of interest. This provides an opportunity for any points of contention between the installation and its customers to be discussed and, just occasionally, settled to everyone's satisfaction.

The conference also acts as a clearing house for the various technical communications received from, for example, the Central Computer Agency, the British Computer Society, various user groups and so on. Representatives are nominated to attend meetings and report back, and in due course the official proceedings are circulated. By this means it is hoped to achieve a widespread dissemination of information on new techniques and hardware and software developments.

The agenda for the conference is usually standard and a specific item called 'In the field' is always included. Under this heading Chief Programmers are free to exchange ideas and experience and, from time to time, to have a good moan! It has proved a very useful facility for focusing on common problems and, on one or two occasions, has provided a slot for a formal presentation of a technique or an idea. The item is also used to preview coming central software 'attractions' and to provide an opportunity for users to have their say about what is proposed—or threatened!

Standards

This is probably one of the most emotive words bandied around in ADP circles. Universal lip service is paid to the need for standards throughout ADP—accompanied by almost as wide a range of definitions of the standards function.

However heartfelt and sincere may be management's intention to make standards acceptable, helpful and therefore popular with those to whom they apply, their introduction inevitably brings a reaction. This can vary from immediate and devious attempts to get round them,

to using their existence as an excuse for missing project target dates. But the inescapable fact is that a large installation cannot be run without rules (sorry, standards).

Fortunately, most of the really necessary ones can be made both painless and mandatory by the use of systems software. For example, there may be programmers who consider that, since the language they are programming in has facilities for latching a fast-line printer on to their program, they should be allowed to do precisely that, whenever and however they consider necessary, notwithstanding that the printer and its attendant operators are thereby forced to sit metaphorically sucking their thumbs while the programmer's wonder-child rambles around collecting the data to be output and sending it forth in sporadic bursts. The vast majority, however, can see the sense in having a set of rules (there I go again!) governing the use of printers which enable the installation's operating staff to exercise a measure of control over this important and time-consuming function—to the mutual benefit of all. Thus, at the Hastings installation, in common with other large installations, programmers are not allowed to write programs which access printers directly. Simple rules are laid down and data required to be printed is stored on magnetic tape together with information about its volume and the type of stationery it requires so that operating staff can schedule the large volumes of printing required and ensure economic and effective use of the battery of printers available. This 'standard' is enforced and facilitated by appropriate systems software.

Programmers use remote terminals extensively for program development and there are now very few diehards in Computing Division who do not concede that the benefits of quick turnround and better programmer motivation far outweigh the undeniable risks of loss of control of the programming function, poor documentation, waste of machine time by inadequate desk checking, etc, usually attributed to on-line program development.

But terminal access to a computer is a powerful weapon and programmers are uniquely placed to take full advantage of it. Heavy responsibility must, therefore, be placed on those senior programmers nominated as responsible for a group of programmers using a particular terminal device. In addition, occasional spot checks must be carried out by the Programming Manager himself to see that standards (for example, regarding the conditions under which operational data may be accessed from the terminal) are being observed. On the other side of the coin, it is important to keep such standards under close review to ensure, for example, that their observance is not becoming unnecessarily restrictive in areas where the risk of important security breaches is slight.

These are just a few examples of the need for standards. In the review process mentioned the Chief Programmers Conference is frequently used to take the temperature of the water, as it were. Hastings, like many other installations, has evolved over a period of time. A vast

wealth of instructional documentation has been accumulated, and about two years ago an exercise was put in hand to review all of this and reproduce it in the form of programming standards and standard software specifications. This work is about two-thirds completed. The specifications have been classified and indexed and are currently being revised and re-written in a standard format. The distribution of this material is comprehensive; every programmer gets his own copy.

We have tried very hard not to take all the fun out of programming. Modular programming is recommended and indeed the accepted divisional technique. Senior programmers can use or encourage 'structured' techniques within their section, and a number do. In one group of project branches we have decided to go the whole hog and adopt the CCA-recommended technique of Jackson's Structured Design Method. But with a vast edifice of individualistically programmed software, both modular and monolithic, to maintain, change must inevitably be slow and evolutionary.

Programmer training

Our philosophy on programmer recruitment and training may be summed up as 'growing our own' and 'doing it ourselves'. Losses of specialist staff are high, in common with many other ADP organizations both inside and outside of government. Nevertheless we regard it as essential that all programmers should be given a good grounding not only in the programming languages that they will use, but also in the subject-matter and characteristics of the installation, and in that somewhat intangible attribute that all organizations possess which might be described as its style. A basic new-entrant programming course is, therefore, given to all specialist EO entrants to the Division. This lasts four-and-a-half months and is based mainly on self-teaching methods using both audio and video material as well as written text. It is supervised by a course director and a number of course advisers, each of whom takes up to six students (eight, if we are really pushed) at a time and acts as their guide and mentor throughout the course. The emphasis throughout is on practical and typical applications of theory and technique.

As the Programming Manager has the training section within his branch, he does at least get the opportunity to meet all new programming staff at least once in their careers!

Communications and feedback

This is a major problem and the fact that it remains only partially solved in Computing Division does not arise from any lack of appreciation on the part of management that it exists. Like long-distance running, programming is often a lonely business but, generally speaking, programmers will happily discuss their problems amongst themselves. There is, however, a general reluctance to speak to more senior management at other than a fairly superficial level. Earlier in this

article the functions of the Chief Programmers Conference were discussed. While this conference is a valuable channel of communication and feedback, it is not and cannot be expected to be the full answer to the problem.

Some supplementary devices have been considered. Should we hold regular or occasional conferences of all programmers? If we did, how should they be organized? If we got all the programmers together, would not the sheer weight of numbers inhibit contributions from the floor? Against that, a number of small conferences would merely add to the communications problem since the proceedings of each would have to be communicated to those who were not present if the full benefit was to be obtained. In the end the idea was dropped.

A regular newsletter addressed to all programmers, indeed to all staff, was also considered. But at what level should it be pitched? The Programming Manager's branch already produces a *Software digest* at monthly intervals and a suggestion was made that this might be expanded to embrace wider and more general topics. This idea too was rejected. The *Software digest* had, by definition, to be highly technical and it was not thought that it could at one and the same time be made chatty and informal.

A recent development has been the publication and distribution of a series of *Situation reports* compiled personally by the Head of Division. These have proved popular and have served to keep staff at all levels informed of the general direction in which the Division as a whole is heading.

But it will not have escaped attention that such communication as exists is nearly all one way. Unless it is actively and specifically pursued, 'feedback' from the programming grass roots just does not happen and it seems extraordinarily difficult for middle and senior management to find out what is really happening at the coal-face so to speak. Formal studies have from time to time been mounted which have involved interviews with staff at EO and HEO level. These have provided answers to specific questions but were expensive in resources and time. The Programming Manager himself makes frequent resolutions to go out and talk to more programmers more often. But inevitably the pressures of other work take their toll on these good intentions. (However, now that he has got this article into type . . . who knows?)

Clearly part of the problem lies in that very attribute of computer programming that makes it the self-motivating task that it generally is; its self-containment and individuality. Possibly the adoption of structured methods will make it easier for programmers to share a knowledge of what they are actually doing at any point in time. But, hopefully, this will not be at the expense of any of the interest and fascination of what is still an absorbing job.

Management Bookshelf

Communication in Business

Mrs. B. M. HOWARD, Civil Service Department

We are, all of us, in the communication business. Letters and reports have to be written, the all-insistent telephone demands attention, meetings have to be attended and speeches made. Writing, reading, speaking—even our gestures, conscious or unconscious—all indicate our feelings and transmit our ideas. It is, therefore, highly desirable that we should master the techniques of communication so that we can convey our thought as unequivocally and as clearly as possible. This review suggests some books which may help us as individuals to improve our own performance.

Basic English

The first essential is a command of the English language. In addition to his dictionary, the manager's other basic tool is a copy of *Roget's Thesaurus* (Penguin; £1·75), that invaluable 'classified catalogue of words' whose index leads him to a choice of phrases, one of which will express his exact meaning. But semantic correctness by itself is not enough. The purpose of writing is to convey a ready and precise meaning to the reader. Dickens invented the Circumlocution Office and still today newspapers happily jibe at examples of official-ese. No one would deny the need for careful drafting, but a salutary study might be made of Sir Ernest Gowers's *Plain Words* (revised by Sir Bruce Fraser; second edition 1973; HMSO; £3.00). Perhaps better to dip into, rather than read cover-to-cover; hence the ideal bedside book. Those of us who have trouble with hyphen avoidance, incongruous participles or appositional commas may take help and comfort from *Mind the Stop*, a brief guide to punctuation by G. V. Carey (Penguin; 1971; 124 pages; £0·60).

When confronted by other writers' outpourings, the Industrial Society's *Guide to Rapid Reading* may be most welcome (1977; 44 pages; £0·95). It gives guidance both on increasing speed and on improving the quality of comprehension and retention.

Letters and reports

Numerous examples of elegant letter-writing may be found on the shelves of your local library; few, however, are suitable examples for the executive to emulate. More to the point might be *The Businessman's Guide to Letter-Writing and the Law on Letters* by 'Ewan Mitchell' (the pen

name of Greville Janner, QC, MP). This describes the techniques of the efficient and successful letter-writer who, it is said, should be 'a man of executive polish and commercial acumen'. (Second edition 1977; Business Books; 222 pages; £6·95.)

As well as writing letters, the executive is often faced with producing management, scientific or technical reports in which a given problem is examined, information conveyed and recommendations made. It is, therefore, important to marshal facts coherently. A brief guide which has stood the test of time is BACIE's *Report Writing* (23 pages; £0·75 members; £1·10 others). A handbook on the same subject was published last year by the Industrial Society: *A Guide to Report Writing* (30 pages; £0·95). There are, of course, many other more substantial books on the subject, some of them directed at specific professions.

Committees

A recent light-hearted article in a management journal suggested that, in order to expedite proceedings, no chairs should be provided for committees! This is, perhaps, a somewhat extreme view, but who of us has not endured a badly run meeting, wishing ourselves elsewhere? Barry Maude's *Managing Meetings* (1975; Business Books; 265 pages; £5·95) outlines some planning and control techniques to improve the success rate of what can be unsatisfactory and unco-ordinated conflicts. Cartoons and simple diagrams illustrate the text.

Responsibility for the effective handling of meetings is shared by the secretary and the chairman. The Home Office Unit for Educational Methods (Moreton-in-Marsh, Glos.) has produced a diagrammatic and brief guide to the duties of *The Committee Secretary* (1976; 70 pages; £1·50). This is designed to help a newly appointed secretary, with little or no experience of this work, to perform the practical details of the function. His guide to the documentation of the meeting might well be the well-known *Hours into Minutes* by P. J. C. Perry, first published by BACIE in 1966 (31 pages; £0·75 members, £1·50 others).

'To be a good chairman, one must have the feel for responsibility and a capacity for leadership.' This dictum is from the foreword to Howard Garrett's *Chairmanship and Committees* (1978; Witherby & Co. Ltd, 5 Plantain Place, Crosby Row, London SE1; 25 pages; £1·80), a guide to the techniques of the Chair.

Speeches

Sir Winston Churchill, when asked whether in his view he was a born orator, replied: 'No. It is just very, very hard work.' But it is work which officials as well as politicians are often called upon to perform—informally or formally; speaking to organized gatherings, to the Press, or on radio or television. Some 'tricks of the trade' are given by Colin Neil MacKay in *Speak for Yourself: the professional man's guide to speeches, interviews and public appearances* 1971; Gower Press for the Institute of Directors; 194 pages; £5·75). This might well be supplemented by the CBI booklet: *Don't be Afraid of the Box* (1974; 23 pages; £0·75).

The executive may also be called upon to deliver a lecture, which may require some visual aids or a practical demonstration. Guidance on these techniques is forthcoming from Len Powell's handbook *Lecturing* (1973; Pitman; 140 pages; £2·50). The speaker will hope that his sponsors have taken the precaution of studying Charles Gibbs-Smith's notes on *The Arrangement of Lectures*, published by the Museums Association (second edition 1974; 6 pages; £0·45), which indicates the professionalism necessary for the organization of such functions.

The telephone

'Come here. I want you'—was the first telephoned speech, delivered in 1876 by Alexander Graham Bell to his assistant. One hundred and two years later many of us have still not learned how to project our personality down a pair of telephone wires in order to exploit the medium's full potential. Eve Roman's amusing and witty advice on *How to Use the Telephone Effectively and Economically* (1976; Business Books; 160 pages; £6·00) gives examples of conversations which will be embarrassingly familiar to all of us.

Non-verbal communication

The recent best seller by Desmond Morris, *Man-watching* (1977; Cape; 320 pages; £8·95), illustrates ways in which men and women unconsciously reveal aspects of their personality. As well as an amusing pastime at an airport or railway station, the study of 'non-verbal communication' is useful for the businessman as an aid to interpreting real, as opposed to avowed, emotions. If you think that your colleague pulled his ear because it itched, or stroked the back of his neck because of an ache, you were probably missing half of what he was communicating. Perhaps you should find out *How to Read a Person Like a Book* (by Gerard Nierenberg and Henry Caleno; 1973; Tandem; 184 pages; £0·95).

Some recently published titles

Micrographic goods and services available from MAGB members. Published by the Microfilm Association of Great Britain, 8 High Street, Guildford, Surrey GU2 5AJ; 25 pages; free to MAGB members, £1·00 to non-members.

The Computer Users' Year Book 1978. Published by The Computer Users' Year Book, 430 Holdenhurst Road, Bournemouth BH8 9AA; 1018 pages; £21·95 plus postage. This is the 10th edition; new sections this year include a study and a three-year prognosis on the world-wide development of computer networks, an examination of the personal computing field, and a bibliography of newly published computer literature classified under 66 categories ranging from artificial intelligence to word processing.

The Gospel according to Harvard Business School: The Education of America's Managerial Elite by P. Cohen. Published by Penguin Books Ltd; 331 pages; price £0·85.

New CSD Publications

This is a list of the documents recently issued by the Civil Service Department and its associated bodies. It includes material from the Civil Service College and the Civil Service Commission, as well as from CSD itself.

These items may be examined in the Central Management Library, Civil Service Department, Old Admiralty Building, Whitehall, London SW1A 2AZ.

Unless otherwise stated, requests for copies should be sent to the Central Management Library, CSD, at the above address. HMSO publications may be ordered from PO Box 569, London SE1 9NH; from Government Bookshops, or through any bookseller.

Home Civil Service: Senior Staff Movements
2 pages; published monthly; gratis.

Interchange between the Home Civil Service and the Diplomatic Service. Report of a working group
16 pages; gratis.

Management Training Needs in DHSS Local Offices
21 pages; gratis.

Public Service Pensions. Pensions (Increase) Act 1971: 1978 Annual Review
4 pages; available from HMSO; price £0·04.

Survey of Fringe Bodies. A report by G. Bowen
151 pages; price £1·25.

The Work of Staff Inspectors in the Civil Service: A reading list
26 references; gratis.

Civil Service College

Both titles are available gratis from: The Librarian, Civil Service College, Sunningdale Park, Ascot, Berks SL5 0QE.

The Constitutional and Political Consequences of Devolution, by Vernon Bogdanor. Civil Service College Senior Seminar on Devolution, 22nd–25th May 1978. (CSC Working Paper number 2)
12 pages.

Urban Problems and Policies, by Gaynor Cohen. (CSC Working Paper number 1)
30 pages.

Civil Service Commission

Requests for copies of the first four items should be addressed to: Careers Information Division, Civil Service Commission, Alencon Link, Basingstoke, Hants RG21 1JB. The last two publications are available from: Clerk of Stationery, Civil Service Department, Alencon Link, Basingstoke, Hants RG21 1JB. All six documents are gratis.

Civil Service Careers 1979*: Degree level*
20 pages.
Civil Service Careers 1979*: GCE/CSE level*
12 pages.
Economists: Civil Service careers
35 pages; 3rd edition, 1978.
Statisticians: Civil Service careers
40 pages; 3rd edition, 1978.
Local Recruitment Advertising
12 pages.
Advertising for Specialists: Supplement to 'Local Recruitment Advertising'
4 pages.

Management Services handbooks

Readers may like to be reminded of the titles that are available in the Management Services Handbook series, published by CSD Management Services. They are:

E.125 *Typing services* (44 pages, price 45p)
E.130 *Forms control* (38 pages, price 60p)
E.132 *Centralized dictation systems* (25 pages, price 45p)
E.133 *Transport management* (32 pages, price 55p)
E.134 *Microcopying systems* (55 pages, price £1·30)
E.136 *Management accounting in the Civil Service* (76 pages, price £1·10)
E.137 *Glossary of accounting terms* (28 pages) (Not available outside United Kingdom Civil Service)

Also available:

E.131 *Guide for new managers* (36 pages, price 55p)

Departments may obtain copies from Her Majesty's Stationery Office through their normal departmental publications demand channels. Persons and organizations outside the Civil Service may obtain copies from The Librarian, Central Management Library, Civil Service Department, Room 1/1, Old Admiralty Building, Whitehall, London SW1A 2AZ. Orders must be accompanied by a cheque or postal order, made payable to 'Civil Service Department'. The prices quoted above include postage (within United Kingdom) for a single copy.

Selections of articles

Readers may like to know that selections of articles which have appeared in *MSIG* are available from the Editor. Each selection covers a specific subject-area, for example:

Reducing Expenditure on Postal and Telecommunications Services; two articles; 24 pages; price 86p, including postage.

'Reducing Expenditure on Postal and Telecommunications Services' by A. Phillips.
'Controlling the Telephone Costs of a Large National Insurance Company' by P. W. D. Smith.

Operational Research in Government; four articles; 48 pages; price £1·74, including postage.

'The Use of Operational Research and Systems Analysis in Government Decision-making' by Sir Peter Baldwin, KCB.
'A System of Models for Planning Highways Expenditure' by Dr. K. Aldred and B. L. Glicksman.
'Operational Research in the Planning of Employment Services in Large Cities' by N. F. McGlynn, MBE, M. F. Shutler and P. D. Saalmans.
'Peterhead Bay Harbour—An OR Study into Its Capacity for Tanker Traffic' by W. Russell.

Planning Programming Budgeting Systems; four articles; 52 pages; price £1·91, including postage.

'Planning Programming Budgeting Systems' by J. M. Bridgeman.
'Planning Programming Budgeting Systems II' by J. M. Bridgeman.
'Planning Programming Budgeting in the Police Service in England and Wales' by G. J. Wasserman.
'Planning Programming Budgeting in DES' by J. G. Bagley.

Flexible Working Hours; three articles; 24 pages; price 79p, including postage.

'Flexible Hours Experiments' by G. Galey.
'Flexible Working Hours in DHSS Local Offices' by E. S. Drye.
'Flexible Working Hours—A Policy for the Civil Service' by R. L. Joseph.

Job Satisfaction; four articles; 32 pages; price £1·15, including postage.

'Job Satisfaction in the Civil Service—A Perspective' by K. B. Robertson.
'A Job Satisfaction Approach to a Management Problem' by D. E. Pace.
'"New Model Office" Project in DHSS' by D. Burden.
'Bridging the Information Gap' by J. Hunter and D. B. Crampton.

Other selections include: *Financial Checking and Internal Audit* (two articles; 16 pages; price 51p); *Performance Measurement* (two articles; 16 pages; price 51p); and *Microcopying in Government* (six articles; 37 pages; price £1·50).

Requests for copies should be addressed to The Editor, Management Services in Government, Civil Service Department, Whitehall, London SW1A 2AZ. Persons and organizations outside the Civil Service should enclose with their order a cheque or postal order for the appropriate amount, made payable to 'Civil Service Department'.

Computer Installations for Government Departments

A list of all Government computers as at 1st January 1978 was published as a supplement to the May 1978 edition. Details of computers ordered during the period 1st April to 30th June 1978 are shown in the following table.

DATE OF ORDER	DEPARTMENT[1]	LOCATION	MAIN USES	MANUFACTURER[2] AND TYPE OF COMPUTER
1B Computers on order for administrative and general purposes				
April 1978	Scottish Office	Edinburgh	General administrative computing	IBM 3032
April 1978	MOD (PE)	Bureau West	Bureau administration operations	ICL 2980
May 1978	Foreign and Commonwealth Office	London	Book-keeping and financial estimates	GEC 40/70
2B Computers on order for scientific and technical purposes				
April 1978	Home Office	Sandridge	General scientific computing	DEC PDP 11/60
May 1978	MOD (PE)	London	Aircraft performance calculations	SEL 32/35
May 1978	Industry	Teddington	Numerical analysis	2 × GEC 40/70
May 1978	Industry	Cambridge	Developing software for computer-aided design	DEC PDP 11/34
June 1978	MOD (PE)	Farnborough	Analysis of weather information	SEL 32/75
June 1978	MOD (Army)	Blandford	Operation real-time training	Ferranti Argus 700
June 1978	MOD (Air)	Cosford	Technical training	Prime 300
June 1978	MOD (Air)	Halton	Pathology analysis	Wang 2200 VP-4
June 1978	MAFF	Ardingley	Scientific research	DG Nova 3/12

[1, 2] Refer to supplement to May edition for Department and Manufacturer keys.

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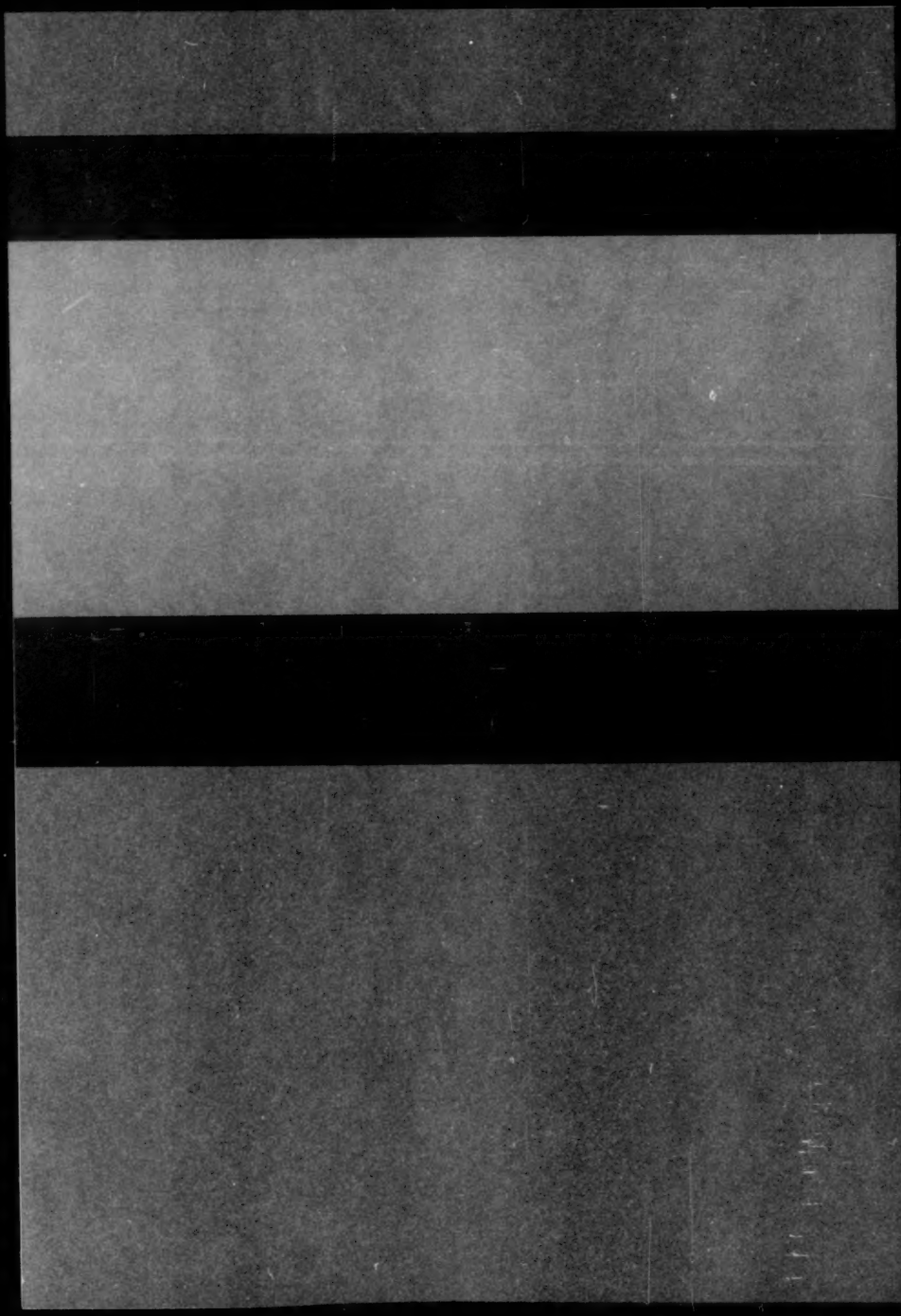
Printed in England for Her Majesty's Stationery Office
by The Campfield Press, St. Albans